

Bereich Simulation - Detaillierung:

22.12.83

Deta.

2

2. Zustandsvektor einteilung

Die Einteilung gilt für eine Raumzelle und erstreckt sich um den gleichen strukturellen Bereich bei jeder weiteren.

1. Raumzellenzustandsgrößen:

- | | |
|----------------------------------|------------------|
| 1. Raumlufttemperatur | 1. Zustandsgröß. |
| 2. Hülleflächentemperaturen (6 " | " |
| 3. Heizkanalbereittemp. | 4 |

Die Reihenfolge ist entsprechend den den Pfeilreserven

X_1 = Raumlufttemperatur

X_2 = Deckentemperatur

X_3 = Wandtemp. - Süden

X_4 = Bodentemp

X_5 = Wandtemp - Norden

X_6 = Wandtemp - Westen

X_7 = Wandtemp - Osten

X_8 = Decken Kanaltemp.

X_9 = Wand Kanaltemp.

X_{10} = Boden Kanaltemp.

X_{11} = Energieschichttemp.

X_{12} = Raumslima (ohne DGL, dient nur der Ausgabe)

Spreizung der Plotdaten SIN2NET vom 9.2.1989

1.4.89
Deler

Energieeinsatztemp.

40°C

50°C

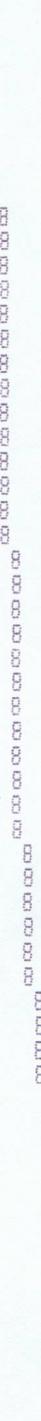
30°C

20°C

0°C

-10°C

Dachkanaltemperatur (8)



Wandkanaltemp (9)



Dach
temp -WTN

Raumluft temperatur (1)
empfundene Raumk (R)

20°C

0°C

-10°C

Boden temperatur (4)



0°C

-10°C

10 kWh

20 kWh

0

-10

10

-10

Ortswertwand
- Rohzeitachse

Energieverbrauch

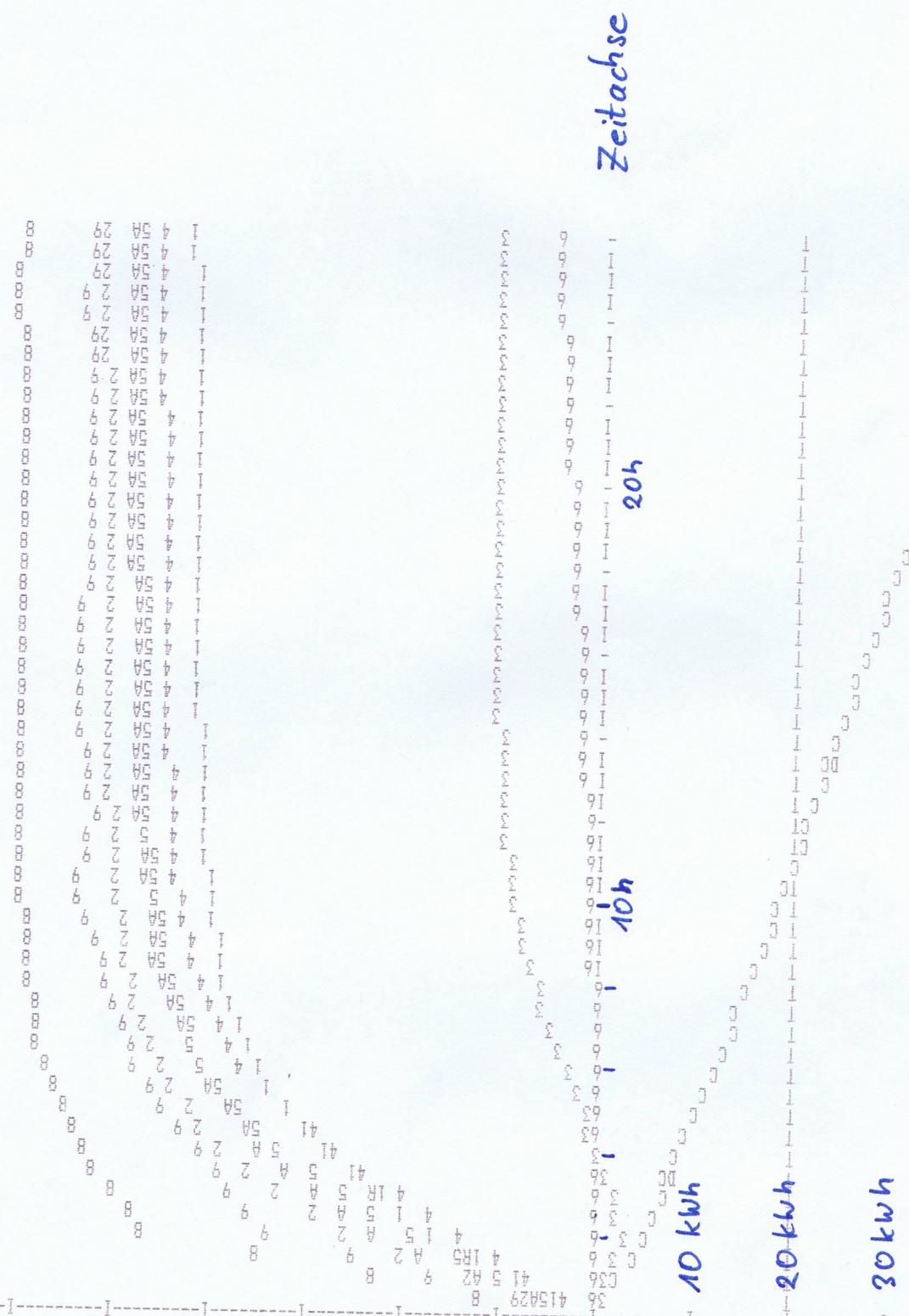
Umgebungstemperatur (T)

Verbrau& [kWh]

Energieverbrauch [kWh]

Plot der Daten SIN2NF vom 9.2.1984
Haussimulation Ritterstraße 51

1.4.84
Deler



I T K INGENIEURBÜRO FÜR TECHNISCHE KYBERNETIK
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7850 Lörrach

Telefon 07621 / 48 515

SIMULATION von Hüllflächenheizungen mit Luft als Arbeitsmedium

Folgende Zustandsgrößen wurden simuliert und dargestellt :

| Zustandsgröße | Bezeichnung | Kurzbeschreibung | Einheit |
|---------------|-------------|----------------------------------|---------|
| 1 | 1 | Raumlufttemperatur | (GC) |
| 2 | 2 | mittlere Deckentemperatur | (GC) |
| 3 | 3 | " Wandtemperatur-Süden | (GC) |
| 4 | 4 | " Wandtemperatur-Norden | (GC) |
| 5 | 5 | " Wandtemperatur-Westen | (GC) |
| 6 | 6 | " Wandtemperatur-Osten | (GC) |
| 7 | 7 | Deckenkanaltemperatur | (GC) |
| 8 | 8 | " Wandkanaltemperatur | (GC) |
| 9 | 9 | Bodenkanaltemperatur | (GC) |
| 10 | A | Energieschachttemp. | (GC) |
| 11 | B | Wärmezufuhr durch Heizung | (kWh) |
| 12 | C | Wärmezufuhr durch Energieschacht | (kWh) |
| 13 | D | Raumklima | (GC) |

22.1.84
D.L.

Heizung
mit
Thermosiphon

B>TOD

current tod: Sun 22-01-1984 16:36:52.00

B>TYPE SIM.DAT

| | | | | | | | | | | | |
|----|-------------|-------------|-------------|--------------|--------------|-------------|--------------|-------------|--------|--|--|
| 0 | 15 | .000000E+00 | .100000E+06 | .100000E+02 | | | | | | | |
| 8 | .200000E+01 | .100000E+02 | | | | | | | | | |
| 9 | .200000E+01 | .100000E+02 | | | | | | | | | |
| 10 | .200000E+01 | .100000E+02 | | | | | | | | | |
| 11 | .200000E+01 | .100000E+02 | | | | | | | | | |
| 0 | .000000E+00 | .000000E+00 | | | | | | | | | |
| | .000000E+00 | .190000E+02 | .227800E+02 | .450000E+01 | .203000E+02 | .212400E+02 | .530000E+01 | .530000E+01 | | | |
| | .235000E+02 | .216000E+02 | .350000E+02 | .000000E+00 | .000000E+00 | .000000E+00 | -.100000E+02 | | | | |
| | .721776E+04 | .190174E+02 | .227962E+02 | .450355E+01 | .203020E+02 | .212869E+02 | .524275E+01 | .524275E+01 | | | |
| | .234871E+02 | .216014E+02 | .350000E+02 | -.128936E+01 | -.128950E+01 | .189130E+02 | -.100000E+02 | | | | |
| | .144210E+05 | .190467E+02 | .228274E+02 | .451989E+01 | .203345E+02 | .212810E+02 | .518368E+01 | .518368E+01 | | | |
| | .235107E+02 | .216190E+02 | .350000E+02 | -.262666E+01 | -.262679E+01 | .189392E+02 | -.100000E+02 | | | | |
| | .216259E+05 | .190548E+02 | .228281E+02 | .452693E+01 | .203406E+02 | .213033E+02 | .513244E+01 | .513244E+01 | .26533 | | |
| | .235194E+02 | .216469E+02 | .350000E+02 | -.409133E+01 | -.409290E+01 | .189461E+02 | -.100000E+02 | | | | |
| | .288295E+05 | .190784E+02 | .228425E+02 | .453700E+01 | .203793E+02 | .213268E+02 | .508876E+01 | .508876E+01 | .26578 | | |
| | .236589E+02 | .216347E+02 | .350000E+02 | -.585556E+01 | -.585520E+01 | .189683E+02 | -.100000E+02 | | | | |
| | .360339E+05 | .190874E+02 | .228498E+02 | .454028E+01 | .203751E+02 | .213279E+02 | .504229E+01 | .504229E+01 | .26545 | | |
| | .235425E+02 | .216549E+02 | .350000E+02 | -.782856E+01 | -.782825E+01 | .189750E+02 | -.100000E+02 | | | | |
| | .432353E+05 | .190950E+02 | .228740E+02 | .454587E+01 | .203804E+02 | .213263E+02 | .500789E+01 | .500789E+01 | .26557 | | |
| | .235107E+02 | .216321E+02 | .350000E+02 | -.989451E+01 | -.989462E+01 | .189825E+02 | -.100000E+02 | | | | |
| | .504471E+05 | .191114E+02 | .228728E+02 | .455546E+01 | .204126E+02 | .213489E+02 | .497047E+01 | .497047E+01 | .26512 | | |
| | .230759E+02 | .217908E+02 | .350000E+02 | -.120435E+02 | -.120425E+02 | .189998E+02 | -.100000E+02 | | | | |
| | .576519E+05 | .191160E+02 | .228764E+02 | .455729E+01 | .204054E+02 | .213209E+02 | .493955E+01 | .493955E+01 | .26505 | | |
| | .230019E+02 | .217977E+02 | .350000E+02 | -.142232E+02 | -.142227E+02 | .189992E+02 | -.100000E+02 | | | | |
| | .648600E+05 | .191175E+02 | .228784E+02 | .455788E+01 | .203996E+02 | .213831E+02 | .490996E+01 | .490996E+01 | .26568 | | |
| | .235784E+02 | .216871E+02 | .350000E+02 | -.164691E+02 | -.164696E+02 | .190026E+02 | -.100000E+02 | | | | |
| | .720893E+05 | .191217E+02 | .228797E+02 | .456246E+01 | .204070E+02 | .213526E+02 | .488159E+01 | .488159E+01 | .26568 | | |
| | .234003E+02 | .215725E+02 | .350000E+02 | -.187694E+02 | -.187590E+02 | .190046E+02 | -.100000E+02 | | | | |
| | .793158E+05 | .191214E+02 | .228806E+02 | .456106E+01 | .204079E+02 | .213640E+02 | .485444E+01 | .485444E+01 | .26486 | | |
| | .232268E+02 | .216828E+02 | .350000E+02 | -.210664E+02 | -.210588E+02 | .190045E+02 | -.100000E+02 | | | | |
| | .865307E+05 | .191205E+02 | .228802E+02 | .456062E+01 | .204063E+02 | .213500E+02 | .483318E+01 | .483318E+01 | .26541 | | |
| | .236758E+02 | .216536E+02 | .350000E+02 | -.234040E+02 | -.233999E+02 | .190026E+02 | -.100000E+02 | | | | |
| | .937392E+05 | .191189E+02 | .228792E+02 | .455986E+01 | .203974E+02 | .213636E+02 | .481285E+01 | .481285E+01 | .26605 | | |
| | .239972E+02 | .215638E+02 | .350000E+02 | -.257347E+02 | -.257540E+02 | .190011E+02 | -.100000E+02 | | | | |

B>TYPE HAUS.DAT

| | | | | | | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------|--|--|--|
| 22 | 1 | 1984 | 16 | 36 | 16 | | | | | | |
| 1 | 1 | | | | | | | | | | |
| .900000E+02 | | | | | | | | | | | |
| .200000E+02 | .100000E+04 | .500000E+01 | .558000E+01 | .228806E+02 | .215336E+02 | .191197E+02 | .265686E+02 | .57565 | | | |
| .300000E+02 | | | | | | | | | | | |
| .200000E+02 | .100000E+04 | .120000E+01 | .558000E+01 | .455985E+01 | .147408E+02 | .191197E+02 | -.100000E+02 | .55800 | | | |
| .180000E+02 | | | | | | | | | | | |
| .300000E+02 | .500000E+03 | .200000E+01 | .558000E+01 | .204034E+02 | .196557E+02 | .191197E+02 | .215105E+02 | .57229 | | | |
| .300000E+02 | | | | | | | | | | | |
| .200000E+02 | .100000E+04 | .500000E+01 | .558000E+01 | .213424E+02 | .205463E+02 | .191197E+02 | .241993E+02 | .56872 | | | |
| .180000E+02 | | | | | | | | | | | |
| .300000E+03 | .100000E+04 | .500000E+00 | .558000E+01 | .479461E+01 | .169426E+02 | .191197E+02 | -.100000E+02 | .55800 | | | |
| .150000E+02 | | | | | | | | | | | |
| .300000E+03 | .100000E+04 | .500000E+00 | .558000E+01 | .479461E+01 | .169426E+02 | .191197E+02 | -.100000E+02 | .55800 | | | |
| .150000E+02 | | | | | | | | | | | |
| .100000E+00 | .200000E+01 | .120000E+02 | .240000E+02 | .465504E-01 | .265686E+02 | | | | | | |
| .100000E+00 | .300000E+01 | .300000E+01 | .600000E+01 | .465504E-01 | .241993E+02 | | | | | | |
| .100000E+00 | .200000E+01 | .120000E+02 | .240000E+02 | .465504E-01 | .215105E+02 | | | | | | |
| .500000E+00 | .500000E+00 | .300000E+01 | .120000E+01 | .465504E-01 | .350000E+02 | | | | | | |

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current tod: Mon 23-01-1984 17:11:48.00

B>TYPE SIM23.DAT

| | | | | | | | | | |
|----|-------------|-------------|-------------|--------------|-------------|-------------|--------------|-------------|---------|
| 0 | 15 | .000000E+00 | .100000E+06 | .100000E+02 | | | | | |
| 8 | .200000E+01 | .100000E+02 | | | | | | | |
| 9 | .200000E+01 | .100000E+02 | | | | | | | |
| 10 | .200000E+01 | .100000E+02 | | | | | | | |
| 11 | .200000E+01 | .100000E+02 | | | | | | | |
| 0 | .000000E+00 | .000000E+00 | | | | | | | |
| | .000000E+00 | .190000E+02 | .227800E+02 | .450000E+01 | .203000E+02 | .212400E+02 | .530000E+01 | .530000E+01 | .000000 |
| | .000000E+00 | .000000E+00 | .000000E+00 | .000000E+00 | .000000E+00 | .000000E+00 | -.100000E+02 | | |
| | .721366E+04 | .163222E+02 | .165331E+02 | .384049E+01 | .130548E+02 | .147495E+02 | .519572E+01 | .519572E+01 | .14846 |
| | .113893E+02 | .738373E+01 | .809533E-05 | .200879E+01 | .198443E+01 | .156463E+02 | -.100000E+02 | | |
| | .144297E+05 | .130999E+02 | .132309E+02 | .254186E+01 | .101442E+02 | .117630E+02 | .497933E+01 | .497933E+01 | .12009 |
| | .927889E+01 | .597910E+01 | .140467E-04 | .349825E+01 | .347386E+01 | .125384E+02 | -.100000E+02 | | |
| | .216452E+05 | .104742E+02 | .106828E+02 | .125874E+01 | .820640E+01 | .954040E+01 | .467424E+01 | .467424E+01 | .98133 |
| | .767579E+01 | .500484E+01 | .117249E-04 | .490355E+01 | .487392E+01 | .100328E+02 | -.100000E+02 | | |
| | .288481E+05 | .835961E+01 | .864103E+01 | .856737E-01 | .667617E+01 | .778314E+01 | .431033E+01 | .431033E+01 | .80325 |
| | .639068E+01 | .421677E+01 | .858336E-05 | .610821E+01 | .608582E+01 | .802749E+01 | -.100000E+02 | | |
| | .360482E+05 | .664208E+01 | .696318E+01 | -.919638E+00 | .541383E+01 | .629201E+01 | .391496E+01 | .391496E+01 | .66128 |
| | .498709E+01 | .352091E+01 | .916399E-05 | .708843E+01 | .706434E+01 | .638295E+01 | -.100000E+02 | | |
| | .432884E+05 | .524102E+01 | .557841E+01 | -.177025E+01 | .435994E+01 | .504980E+01 | .349740E+01 | .349740E+01 | .52408 |
| | .425525E+01 | .297745E+01 | .776361E-05 | .783719E+01 | .781271E+01 | .503239E+01 | -.100000E+02 | | |
| | .505087E+05 | .409779E+01 | .444806E+01 | -.250695E+01 | .350210E+01 | .402880E+01 | .307619E+01 | .307619E+01 | .42498 |
| | .352971E+01 | .245266E+01 | .730711E-05 | .840612E+01 | .837723E+01 | .393424E+01 | -.100000E+02 | | |
| | .577180E+05 | .317697E+01 | .349837E+01 | -.313656E+01 | .278651E+01 | .321060E+01 | .266064E+01 | .266064E+01 | .33735 |
| | .285535E+01 | .201288E+01 | .823607E-05 | .881856E+01 | .879137E+01 | .303893E+01 | -.100000E+02 | | |
| | .649383E+05 | .241821E+01 | .273725E+01 | -.359799E+01 | .220284E+01 | .249060E+01 | .226129E+01 | .226129E+01 | .26125 |
| | .296059E+01 | .172734E+01 | .841959E-05 | .911377E+01 | .909214E+01 | .230338E+01 | -.100000E+02 | | |
| | .721624E+05 | .177583E+01 | .209004E+01 | -.396508E+01 | .169988E+01 | .192170E+01 | .187398E+01 | .187398E+01 | .20322 |
| | .175095E+01 | .131406E+01 | .824971E-05 | .932083E+01 | .929702E+01 | .168129E+01 | -.100000E+02 | | |
| | .793707E+05 | .124438E+01 | .155952E+01 | -.425919E+01 | .128528E+01 | .141799E+01 | .151874E+01 | .151874E+01 | .15318 |
| | .131755E+01 | .101938E+01 | .828830E-05 | .947118E+01 | .943138E+01 | .116525E+01 | -.100000E+02 | | |
| | .866065E+05 | .785269E+00 | .109161E+01 | -.450487E+01 | .914706E+00 | .101354E+01 | .121015E+01 | .121015E+01 | .10711 |
| | .993694E+00 | .745686E+00 | .822004E-05 | .955465E+01 | .952285E+01 | .719627E+00 | -.100000E+02 | | |
| | .938146E+05 | .386355E+00 | .685128E+00 | -.471798E+01 | .582657E+00 | .644692E+00 | .940426E+00 | .940426E+00 | .67936 |
| | .620722E+00 | .492787E+00 | .842409E-05 | .960279E+01 | .957691E+01 | .331158E+00 | -.100000E+02 | | |

B>TYPE HAUS.DAT

| | | | | | | | | | |
|-------------|-------------|-------------|-------------|--------------|--------------|-------------|--------------|--------|--|
| 23 | 1 | 1984 | 16 | 59 | 44 | | | | |
| 1 | 1 | | | | | | | | |
| .900000E+02 | | | | | | | | | |
| .200000E+02 | .100000E+04 | .500000E+01 | .558000E+01 | .356289E+00 | .252994E+00 | .678763E-01 | .355431E+00 | .55804 | |
| .300000E+02 | | | | | | | | | |
| .200000E+02 | .100000E+04 | .120000E+01 | .558000E+01 | -.488399E+01 | -.142141E+01 | .678763E-01 | -.100000E+02 | .55800 | |
| .180000E+02 | | | | | | | | | |
| .300000E+02 | .500000E+03 | .200000E+01 | .558000E+01 | .310993E+00 | .169386E+00 | .678763E-01 | .277002E+00 | .55803 | |
| .300000E+02 | | | | | | | | | |
| .200000E+02 | .100000E+04 | .500000E+01 | .558000E+01 | .333821E+00 | .238572E+00 | .678763E-01 | .327600E+00 | .55802 | |
| .180000E+02 | | | | | | | | | |
| .300000E+03 | .100000E+04 | .500000E+00 | .558000E+01 | .719011E+00 | .166833E+00 | .678763E-01 | -.100000E+02 | .55800 | |
| .150000E+02 | | | | | | | | | |
| .300000E+03 | .100000E+04 | .500000E+00 | .558000E+01 | .719011E+00 | .166833E+00 | .678763E-01 | -.100000E+02 | .55800 | |
| .150000E+02 | | | | | | | | | |
| .100000E+00 | .200000E+01 | .120000E+02 | .240000E+02 | .945087E-02 | .355431E+00 | | | | |
| .100000E+00 | .300000E+01 | .300000E+01 | .600000E+01 | .945087E-02 | .327600E+00 | | | | |
| .100000E+00 | .200000E+01 | .120000E+02 | .240000E+02 | .945087E-02 | .277002E+00 | | | | |
| .500000E+00 | .500000E+00 | .300000E+01 | .120000E+01 | .945087E-02 | .843687E-05 | | | | |

B>

Kühlung mit
Thermosiphon

22.1.84
Dolar
2h - Reduziert

